

CS377E: ENGELBART'S UNFINISHED LEGACY: DESIGNING SOLUTIONS TO GLOBAL GRAND CHALLENGES


Design Discovery: Contextual Inquiry & Task Analysis

Prof. James A. Landay
 Computer Science Department
 Stanford University

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Outline

- Design Discovery
- Contextual Inquiry
- Task Analysis
- Point of View Drafts



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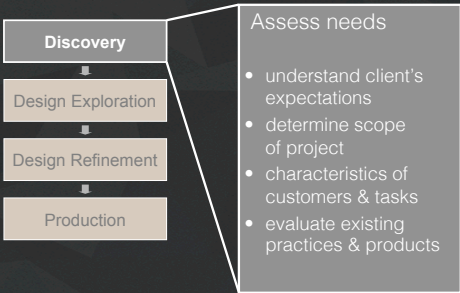
“You Are Not the Customer”



- Seems obvious, but...
 - different experiences
 - different terminology
 - different ways of looking at the world
- Easy to think of self as typical customer
- Easy to make mistaken assumptions

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Design Process: Discovery



- Discover
- Design Exploration
- Design Refinement
- Production

Assess needs

- understand client's expectations
- determine scope of project
- characteristics of customers & tasks
- evaluate existing practices & products


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Understanding the Customer

- How do you learn how your customers work?
 - task analysis, interviews, self report, experience sampling (ESM), logging/analytics & observation
- How do you learn how your customers think?
 - understand human cognition
 - observe users performing tasks
- How do you learn how your customers interact with UIs?
 - analytics & logging
 - observe!

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Contextual Inquiry




- Way of understanding customers' needs and work practices
- Master / Apprentice model allows customer to teach us what they do!
 - master does the work & talks about it while working
 - we interrupt to ask questions as they go
- The *Where*, *How*, and *What* expose the *Why*
- Differences from DT Empathy Techniques
 - more targeted to a particular problem/domain
 - uses a particular style of observation/interview

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Principles

Context

- contact real/intended customers
- go to the workplace/home & see the activity as it unfolds
- people summarize, but we want details
 - keep it concrete when people start to abstract
 - "We usually get reports by email", ask "Can I see one?"



Principles (cont.)

Context

- contact real/intended customers
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Interpretation

- facts are only the starting point, design based on interpretation
- validate & rephrase
 - share interpretations to check your reasoning
 - Ex. "So accountability means a paper trail?"
 - No, not here. It means safety for personnel/equipment
 - people will be uncomfortable until the phrasing is right
 - be committed to listening ("Huh?", "Umm...", "Yes, but...")

Principles (cont.)

Focus

- interviewer needs data about specific kind of activity
 - "steer" conversation to stay on useful topics
- respect triggers (flags to change focus)
 - shift of attention (someone walks in)
 - surprises (you know it is "wrong")

Users: Unique or One of Many?

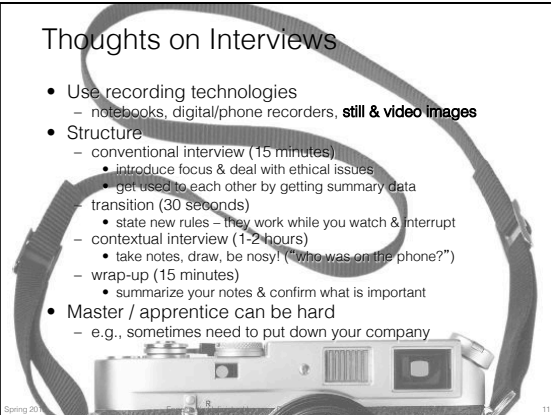
"Take the attitude that nothing any person does is done for no reason; if you think it's for no reason, you don't yet understand the point of view from which it makes sense."

Take the attitude that nothing any person does is unique to them, it always represents an important class of customers whose needs will not be met if you don't figure out what's going on."

(p. 63, Contextual Design)

Thoughts on Interviews

- Use recording technologies
 - notebooks, digital/phone recorders, **still & video images**
- Structure
 - conventional interview (15 minutes)
 - introduce focus & deal with ethical issues
 - get used to each other by getting summary data
 - transition (30 seconds)
 - state new rules - they work while you watch & interrupt
 - contextual interview (1-2 hours)
 - take notes, draw, be nosy! ("who was on the phone?")
 - wrap-up (15 minutes)
 - summarize your notes & confirm what is important
- Master / apprentice can be hard
 - e.g., sometimes need to put down your company





What Customers Might Say

- "This system is too difficult"
- "You don't have the steps in the order we do them"
- Do not take comments personally
 - you shouldn't have a personal stake
- Be careful not to judge participants
- Goal is to make the system easy to use for your intended customers

Using the Data from Contextual Inquiry


- Figure out what is important
- Affinity diagramming
 - group info & find relations between groups
 - Post-Its on large surfaces
 - haptic UI
 - brainstorming
 - immersive
 - persistent
 - also used for creating web info architecture

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Task Analysis

- Use this to organize contextual inquiry data
- Find out
 - who customers are
 - what they need/want to do



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Task Analysis Questions (11)



- Who is going to use the system?
- What tasks do they now perform?
- What tasks are desired?
- How are the tasks learned?
- Where are the tasks performed?
- What's the relationship between customer & data?

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Task Analysis Questions (cont.)



- What other tools does the customer have?
- How do users communicate with each other?
- How often are the tasks performed?
- What are the time constraints on the tasks?
- What happens when things go wrong?

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Who?



- Identity
 - in-house or specific customer is easy
 - need several typical users for broad product
- Background
- Skills
- Work habits and preferences
- Physical characteristics
 - height?


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Best Buy Express: On the Go Gear

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Who (Best Buy Express)?



- Identity?
 - people who are passing through airport
 - business people, tourists, airline employees...
- Background?
 - must have an ATM card or credit card
 - have used other vending/ticket machines before
- Skills?
 - may know how to put cards into ATM

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What Tasks?

- Task: *what the customer wants to do*
 - buy a concert ticket, listen to music on the airplane, buy noise-cancelling headphones, etc.
- Important for both automation & new functionality
- Relative importance of tasks?
- Observe customers, see it from their perspective
 - on-line billing example
 - small dentists office had billing automated
 - assistants were unhappy with new system
 - old forms contained hand-written margin notes
 - e.g., patient A's insurance takes longer than most, etc.

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Selecting Tasks

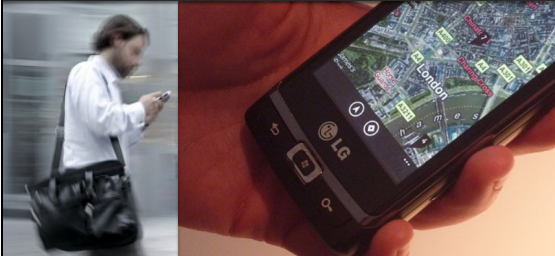
- Real tasks customers have faced
 - collect any necessary materials
- Should provide reasonable coverage
 - compare check list of functions to tasks
- Mixture of simple & complex tasks
 - simple task (common or introductory)
 - moderate task
 - complex task (infrequent or for power customers)

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What Should Tasks Look Like?

- Say what customer **wants to do**, but **not how**
 - allows comparing different design alternatives

Good Bad



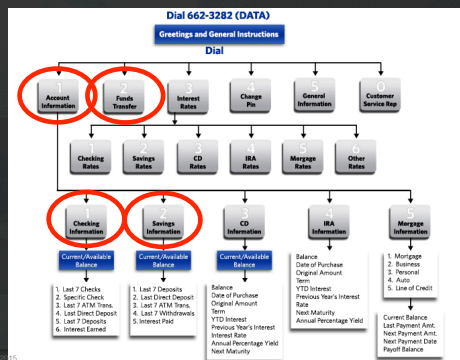
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What Should Tasks Look Like?

- Say what customer **wants to do**, but **not how**
 - allows comparing different design alternatives
- Be very specific – stories based on facts!
 - say who customers are (use personas or profiles)
 - design can really differ depending on who
 - name names (allows getting more info later)
 - characteristics of customers (job, expertise, etc.)
 - forces us to fill out description w/ relevant details
 - example: file browser story or dentists forms
- Some should describe a complete job
 - forces us to consider how features work together
 - example: phone-in bank functions

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What Should Tasks Look Like?



Dial 662-3282 (DATA)

Greetings and General Instructions

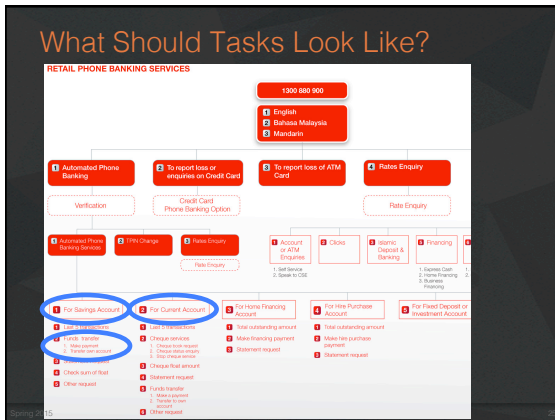
Dial

- 1. Account Information
- 2. Funds Transfer
- 3. Interest Rates
- 4. Change Pin
- 5. General Information
- 6. Customer Service Rep

- 1. Checking Rates
- 2. Savings Rates
- 3. CD Rates
- 4. IRA Rates
- 5. Mortgage Rates
- 6. Other Rates

- 1. Checking Information
- 2. Savings Information
- 3. CD Information
- 4. IRA Information
- 5. Mortgage Information

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Using Tasks in Design

- Write up a description of tasks
 - formally or informally
 - run by customers and rest of the design team
 - get more information where needed

Manny is in the city at a club and would like to call his girlfriend, Sherry, to see when she will be arriving at the club. She called from a friends house while he was on the subway, so he couldn't answer the phone. He would like to check his missed calls and find the number so that he can call her back.

How are Tasks Learned?

- What does the customer need to know
- Do they need training?
 - academic
 - general knowledge / skills
 - special instruction / training

Where is the Task Performed?

- Office, laboratory, point of sale?
- Do they have wet, dirty, or slippery hands?
- Effects of environment on customers?
- Soft drinks?
- Users under stress?
- Lighting?
- Confidentiality required?
- Noise?

What is the Relationship Between Customers & Data?

- Personal data
 - always accessed at same machine?
 - do users move between machines?
- Common data
 - used concurrently?
 - passed sequentially between customers?
- Remote access required?
- Access to data restricted?

What Other Tools Does the Customer Have?

- More than just compatibility
- How customer works with collection of tools
 - Ex. automating lab data collection
 - how is data collected now?
 - by what instruments and manual procedures?
 - how is the information analyzed?
 - are the results transcribed for records or publication?
 - what media/forms are used and how are they handled?

How Do Customers Communicate with Each Other?

- Who communicates with whom?
- About what?
- Follow lines of the organization? Against it?



How Often Do Customers Perform the Tasks?

- Frequent customers remember more details
- Infrequent customers may need more help
 - even for simple operations
 - make these tasks possible to do
- Which function is performed
 - most frequently?
 - by which customers?
 - optimize system for these tasks will improve perception of good performance

What are the Time Constraints on the Task?

- What functions will customers be in a hurry for?
- Which can wait?
- Is there a timing relationship between tasks?



What Happens When Things Go Wrong?

- How do people deal with
 - task-related errors?
 - practical difficulties?
 - catastrophes?
- Is there a backup strategy?



Caveats of User-Centered Design

- Politics
 - “agents of change” can cause controversy
 - get a sense of organization & bond w/ interviewee
 - important to get buy-in from all those involved
- Customers are not always right
 - cannot anticipate new technology accurately
 - job is to build system customers will want
 - not system customers *say* they want
 - be very careful about this (you are outsider)
- Design/observe forever without prototyping
 - rapid prototyping, evaluation, & iteration is key

Further Reading

Task Analysis & Personas

- Books
 - *User and Task Analysis for Interface Design* by Joann T. Hackos, Janice C. Redish
 - *The Inmates are Running the Asylum* by Alan Cooper

Summary

- Know thy user & involve them in design
- Contextual inquiry
 - way to answer the task analysis questions
 - interview & observe real customers
 - use what model to get them to teach you?
 - the master-apprentice model to get them to teach you

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Next Time

- Lecture
 - Prototyping
- Readings
 - Holtzblatt & Beyer, *Contextual Design*, In: *The Encyclopedia of Human-Computer Interaction*, 2nd Ed.
- Project
 - Contextual Inquiry Interviews (due Thur)

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Contextual Inquiry Exercise

- Turn to someone on your right
- Interview that person *using Master-Apprentice* model to find out how they schedule appointments
- 2 minutes
- Switch places & repeat
- 2 minutes

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